

Jenman, in his Synoptical List, described the present species as *Nephrodium rigidulum* Baker, which is synonymous with *D. scalpturoides* (Fée) C. Chr., a species known properly only from Cuba and Hispaniola. From this *D. Underwoodiana* differs in many characters, notably in its less coriaceous texture, its more numerous veins, its hispid midveins and veins (above), its golden resinous glands and pilose-hispid condition beneath, and especially in its medial (not submarginal) sori. The relationship with *D. Nockiana* is very much closer, but that species, as represented by a large suite of Jamaican specimens, is a plant of lower altitudes, with narrower and longer fronds, similarly glandular beneath but having the pinnae narrower and more distant, the costae and midribs merely puberulous beneath, and the upper side of the segments non-hispid. The presence or abundance of minute stiff hairs between the veins on the upper surface is a variable character in all these species.

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Tauranga and Karewha Island

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While I was on a visit to Tauranga, about 100 miles south of Auckland, Mr. Bernard Sladden kindly offered to take me in his launch to Karewha Island. We had such a rough time on leaving the harbor, bobbing about like a cork, that Mr. Sladden feared we should not be able to land, a prediction that, fortunately for me, was not fulfilled.

The little island, six miles from Tauranga, about five acres in extent and rising to a rocky peak 300 feet above the sea, with its mantle of green, looked very beautiful on a near approach. We anchored about fifty yards from the shore in smooth water, protected by a reef and some

rocky islets. A short pull in the dinghy brought us to the shore, where I had no difficulty in landing on a flat boulder. There is no beach proper, just a narrow strip of diorite boulders, ranging in size from a wheelbarrow to an omnibus, wedged tightly together—not a pebble, particle of sand or shell to be seen, if we except some mammoth limpets on the boulders.

Immediately above the rocks and often overshadowing them is a dense growth of small trees with light-green leaves that look as if they had been polished (*Coprosma Baueri*). The light-grey soil beneath is nearly bare from the passage of countless mutton birds, Ha-koa-koa, *Puffinus tenuirostris*, that inhabit the island for breeding purposes; indeed, it is a vast rookery, the whole island, except where the rocks protrude, being covered with their burrows. This makes walking fairly easy, though the ground sometimes gives way and you sink to the knees in one of the burrows. On one of the numerous occasions of this happening, Mr. Sladden descended on top of a mutton bird, a slim, handsome creature, nearly black, with a long beak hooked like that of an albatross. He also got the long white egg, for at this season the birds are setting. They lay but one egg a year. It was a curious sensation to walk in this solitude, where there was no sound or movement of life, and yet to know that there were thousands of noisy, active birds under your very feet.

The trees nearly all grow slanting down hill and are kept vigorous and verdant by the quantities of guano. Besides the Tau-pata (*Coprosma*), we saw a few other species of small trees—hou-para, ka-raka—and one solitary specimen of the para-para, that curious plant, a veritable “upas-tree” for the small birds. It has a sticky gum about the seeds which catches the birds’ wings and holds them until the poor things die of starva-

tion. There were also several patches of Captain Cook's scurvy grass, a large herbaceous plant with white flowers, which preserved the health of his crew during their famous voyages of discovery round New Zealand, and a pale mauve Mesembryanthemum about an inch in diameter.

The only living things which I saw besides the mutton bird so unceremoniously unearthed by Mr. Sladden, were a fantail and a lizard. The "pi-waka-waka," a species of flycatcher, follows one through the bush, the Maoris aver, to catch the insects disturbed by your passage; it is a most friendly little bird, often perching on a twig within a yard, chirping and flirting its beautiful outspread tail. The tua-tara, that strange lizard which lives in good fellowship and peace in the burrows of the mutton bird, *Sphenodon punctatus*, to give it its scientific name, is the oldest living reptile, midway between a turtle and a lizard. Its nearest ancestor lived in North America in the Cretaceous Period. It is found only in New Zealand, on a few small islands. The one I saw, about fourteen inches long, crawled into a mutton bird burrow, trailing its tail in the loose earth, and many such tracks were observed about the island. It is a strange uncouth beast belonging to a bygone age.

All these objects were most interesting, but were not what I came to Karewaha for. My intention was to examine *in situ* a species of fern, named *Asplenium Shuttleworthianum* by Kunze and by Dr. Hooker reduced to a variety of *A. flaccidum*. It is found in New Zealand only on a few guano islands off the east coast, growing upon the rocks and about the roots of the trees in great bunches, many of which you cannot embrace with your two arms, containing over 100 closely compacted fronds, one to two feet long by three to six inches broad, literally in thousands—one could freight a ship with their fronds.

The leaves are stout and leathery, three times divided, the stalk being half the length of the frond. Sometimes the roots of the older plants form a kind of trunk eight inches high. The fronds are never flaccid and pendent, as is usual with *Asplenium flaccidum*, but grow upright, sometimes with a slight curve toward the tip. There appear to be two varieties, one more finely cut than the other.

The only other species that I noted were some strong, vigorous plants of *Asplenium lucidum*, but they differed very little from those found on the mainland. Karewha is well worth while.

I also spent an hour or two on Tuhua, or Mayor Island, 28 miles from Tauranga, over 3,000 acres in extent, and mountainous to a height of 1274 ft. There is no running stream on the island, which is unusual for New Zealand. I found *Pteris comans* growing under the Christmas trees to a great size; I measured a frond 7 ft. 9 in. high by 4 ft. 9 in. broad—about double the usual size. I also found *Lomaria Norfolkiana* which, hitherto, has only been reported from the Three Kings and Little Barrier Islands; I have also found it on the mainland ranging in length from 2 ft. to 3 ft. 2 in. I consider it only a large form of *L. lanceolata*, as one finds every gradation from 8 inches to thirty-eight.

The Mount Mannganui is a conical rocky hill about 1,000 ft. high, standing at the end of a long sand spit separated from Tauranga by an inlet of the sea. It seemed an unpromising field for ferns, yet I found there two species that I had hunted for fifty years, *Lomaria Banksii* and *Asplenium obtusatum*. The former was growing along a crack in a low cliff just above the shelly beach, and is remarkable for the fertile fronds being much shorter than the barren ones. With regard to *Asplenium obtusatum*, I am inclined to place it as a

doubtful variety of *A. lucidum*. It is found only on rocks; the rounded obtuse pinnae grow on the same plants as those with pointed ends.

Mr. Cameron, who took me for another long journey into the Oropi bush, talked enthusiastically about being lowered over a precipice several hundred feet in height in search of some very fine specimens of *Lindsaya viridis*. The sight of a long rope under the car seat filled me with forebodings which, I am happy to say, were groundless.

The weki ponga, *Dicksonia fibrosa*, is the most plentiful tree fern on the mountains behind Tauranga. In one grove of many hundred trees nearly all had several heads, the trunks branching from one main stem. I counted fourteen in one case.

Before closing this paper I must mention a curious incident, though it has no connection with ferns. A great many lemons are grown at Tauranga, where the rich, sandy soil seems to suit them. The cows have developed a taste for the acid fruit and eat them greedily, though the tears trickle from their eyes. It is interesting to know that the crocodile is not the only four-footed animal to shed tears.

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